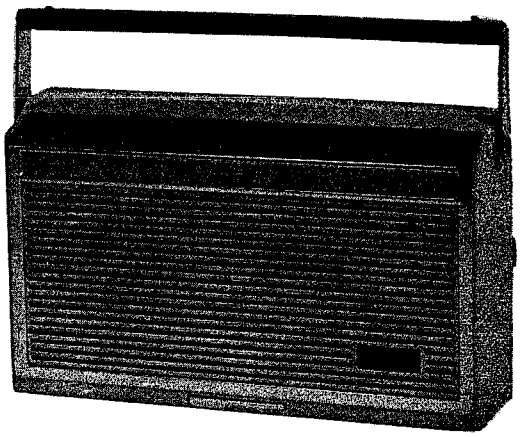
Sharp

# Service Manual

## MINI STEREPHONO



model

# FXG-700

# SPECIFICATIONS

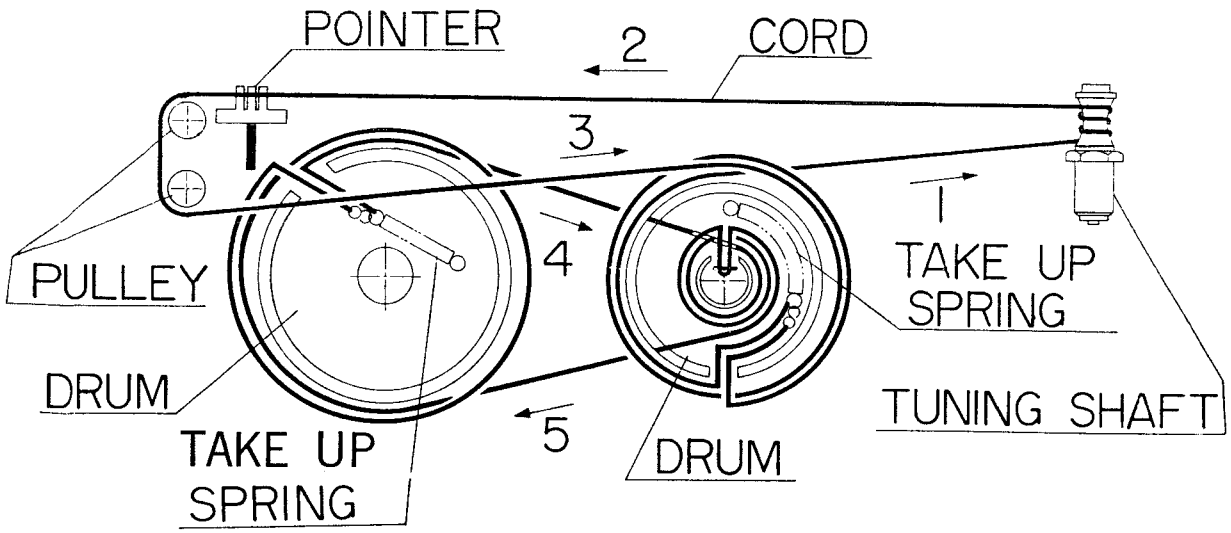
## RADIO

| | |
|---|---|
| Circuit : | 11-transistor, 2-band, super-heterodyne system |
| Tuning Range : | AM : 5351–605KC |
| | FM : 86.5–108MC |
| Intermediate Frequency : | AM : 455KC |
| | FM : 10.7MC |
| Power Output : | 330mW |
| Power Source : | UM-1 (1.5V) × 4 pcs. |
| Speaker : | 3½″ Permanent Dynamic Speaker 10 ohm |
| Dimensions : | 9¾″ (W) × 5¾″ (H) × 2¾″ (D) |
| Weight : | 3.7 lbs. without batteries |

## PHONOGRAPH

| | |
|---|---|
| Speed : | 33⅓ r.p.m. 45 r.p.m. |
| Motor : | 6V DC micro motor |
| Pick-up : | Stereo ceramic pick-up |
| Wow : | 33⅓ r.p.m. ..... under 0.4% |
| | 45 r.p.m. ..... under 0.6% |
| Record : | 10–12 inch 33⅓ r.p.m. 7 inch 45 r.p.m. |

# DIAL CORD STRINGING



# REMOVAL & REPAIR

## 1 Removal of motor plate

Take out 4 screws (2.6S+6B) as shown in Fig.3 and lift up the motor plate gently from "Hook" side.

Put it near the main cabinet as shown in Fig. 4 so that leads may not be cut and the pick-up or the motor plate is not scarred.

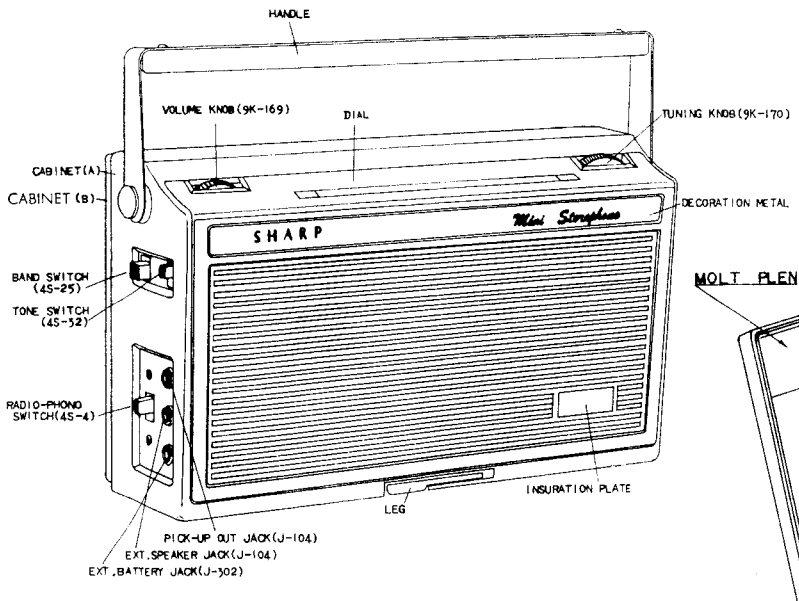



Figure 1

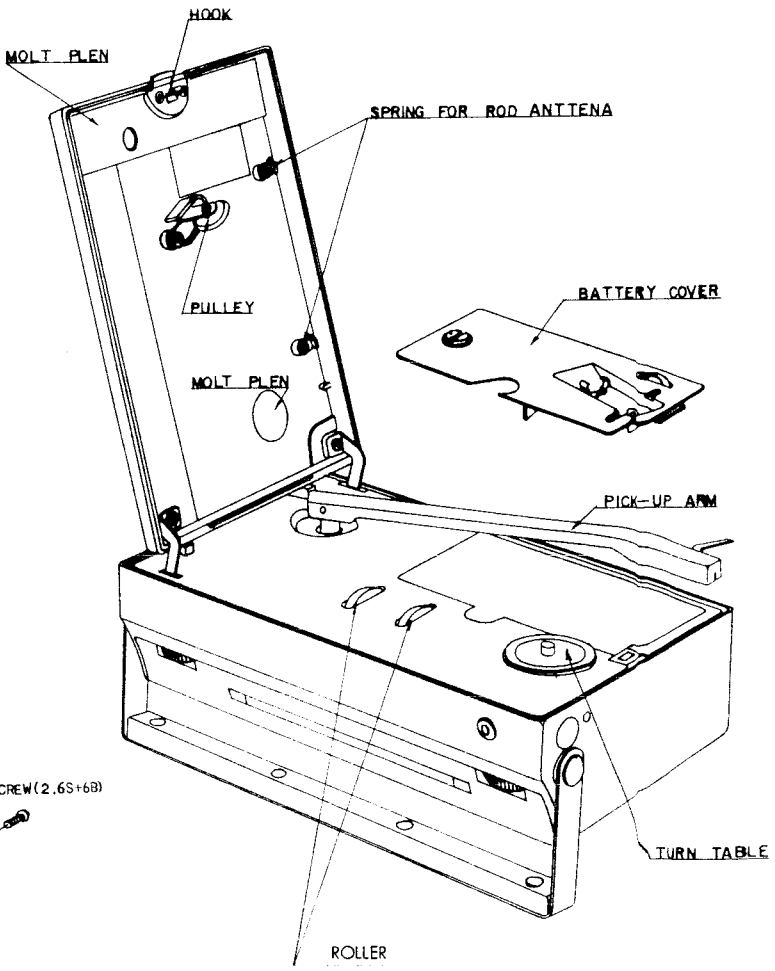



Figure 2

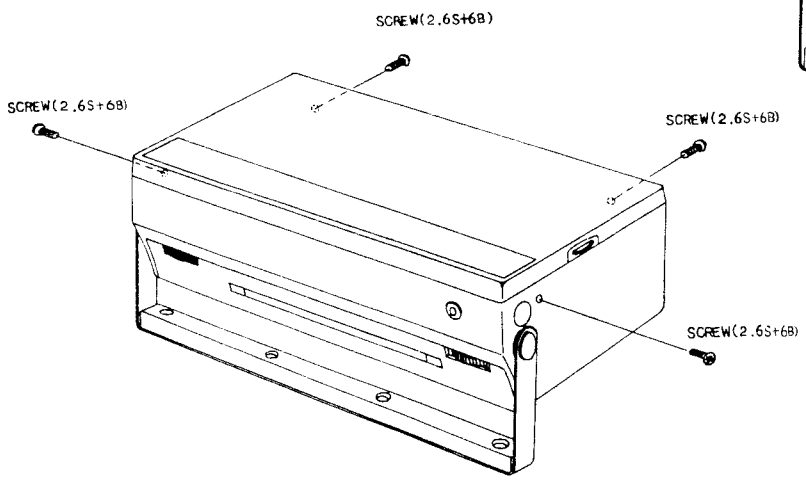



Figure 3

## 2 Removal of circuit board

Take out 5 screws as shown in Fig. 5 after removing the motor plate. Draw a dial knob in the direction of battery terminal springs and lift up the rear plate of the dial so that a volume knob may come out. Simple repairs can be made on the condition mentioned above 1). But complicated ones require the removal of leads from the battery case and the speaker for easier handling and repairing parts.

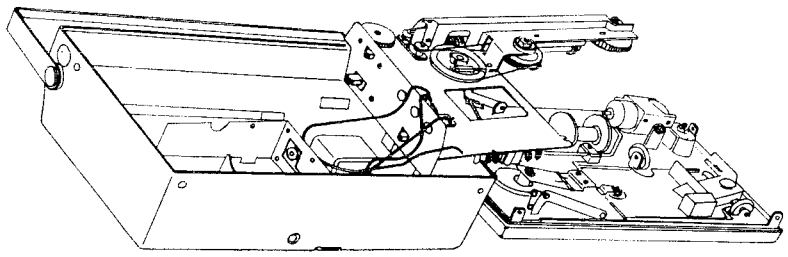


Figure 4

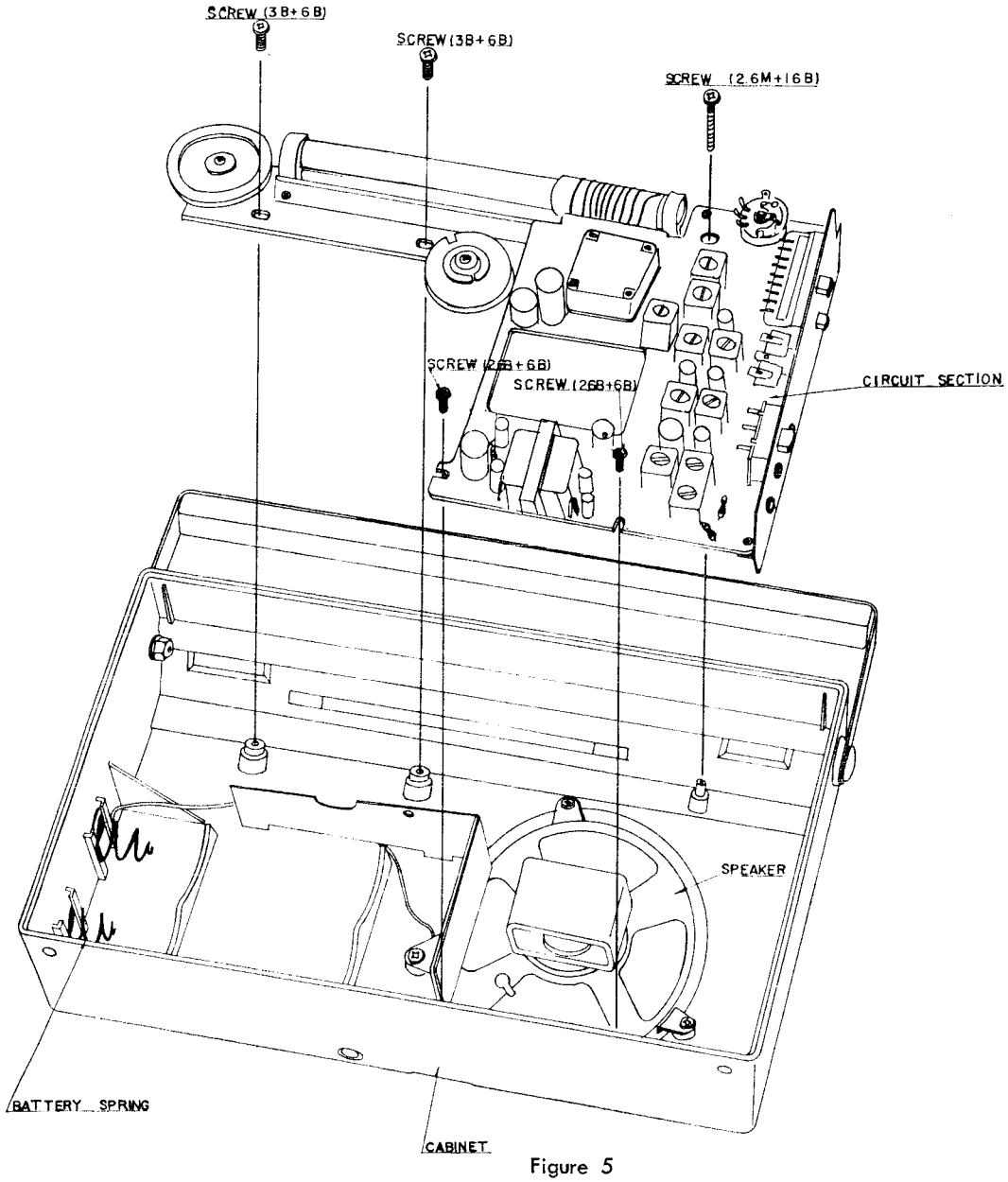


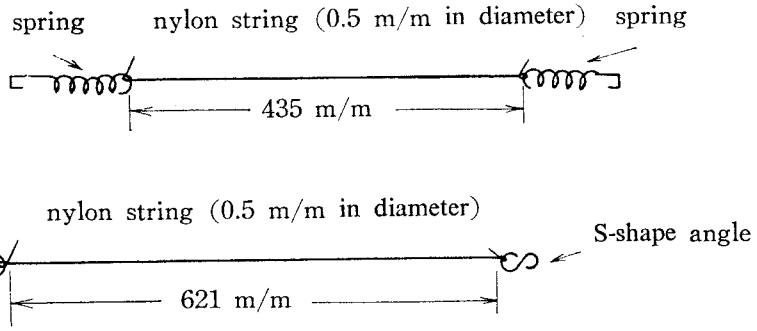

Figure 5

## 3 Dial cord stringing

There are 2 strings as shown in Fig. 6 and 7.

When setting strings, make the procedure in the following way.

Set the dial cord B on the driving shaft and then the dial cord A on the drum of a variable condenser.




Hang the spring of the dial cord B on the angle inside of the wide drum of the double.

Insert a metallic stick 3 m/m in diameter into matched holes of the drum and the rear plate of the dial for fixing the drum.

Wind a string half a round on the drum and three rounds on the driving shaft. After hanging the string on pulleys (P–743, P–476), insert it into the hole of the rear plate of the dial and wind it one and a half round on the double drum and then hang S – shape angle on the spring.

Hang the string of the dial cord A on the projected tip of drum (DP–717) of the variable condenser. After winding it half a round on the drum, insert it into the hole of the rear plate of the dial through which it is to be wound two rounds on the small drum of the double. Then insert the string into a slit of the drum and after winding it once on the square part of the shaft, draw it again from the slit, which should then be wound half a round on the small drum and one round on the drum of the variable condenser.

Set an indicator at the extreme left side of the front, while the spring is hung on the lug of the drum.

Take off the metallic stick previously inserted into the double drum and make it sure whether or not the indicator works smoothly when turning the driving shaft.

Adjust the length of the dial cord B, when the indicator dose not work well.

Notice : Use a dial of 0.5 m/m in diameter, otherwise it may not match frequencies.

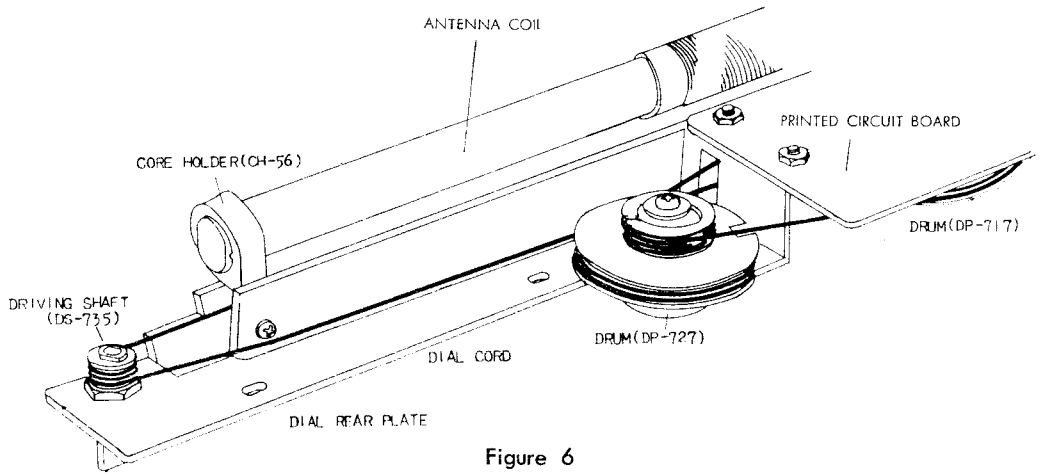



Figure 6

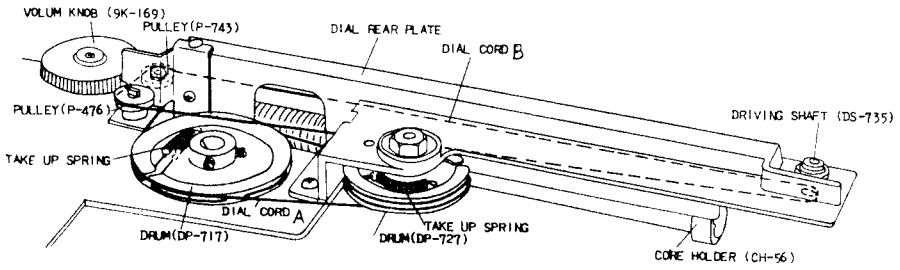



Figure 7

## 4 Repair of record player

1) HOW TO CHANGE A NEEDLE

When proper tonal quality is not gained, change a needle for a new one as follows. (Fig. 8)

Place the set as shown in Fig. 2

Lift up a pick-up-arm and change a needle for a new one after removing a cartridge screw as shown in Fig. 8.

It is recommendable to use a needle for stereophonic record.

2) HOW TO CHANGE A MOTOR

Replace batteries when a motor dose not work or its working condition is not stable. If it dose not work yet even after replacing batteries, wipe off with a damp cloth oil or dusts on the surface of the idler or its adjacent parts.

Turn the idler with your hand to examine its revolving.

(Keep a motor shaft away from the idler when examining it.)

Replacement of the motor is required, if it dose not work after the above procedure.

i) Remove leads of the motor from the motor plate.

ii) Remove a motor suppressing spring for the motor. (Fig.9)

iii) Remove screws after loosening the nuts of screws which fix the motor.

Notice : When assembling, care should be taken not to fasten screws too tight in fixing the motor, otherwise the motor may not revolve smoothly.

3) HOW TO PREVENT THE IDLER FROM VIBRATION

Since the axial vibration of the idler makes the revolution of a record unstable, the following repair is required.

Loosen the plastic nuts of screws which hold the shaft of the idler. Then tighten screws gently to allow the idler to revolve smoothly but without any vibration and fasten nuts so that screws may not get loosened. (Fig.9)

4) HOW TO CHANGE THE PICK-UP

Remove leads from the motor plate and pull the washer outside which is located on the fixing plate of the pick-up as shown in Fig. 9.

When fixing leads, some slack around the washer is needed.

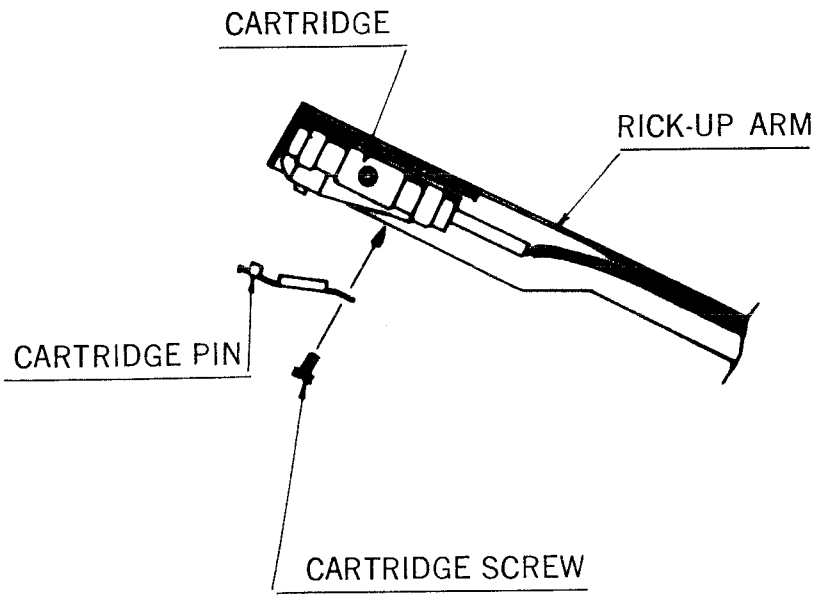



Figure 8

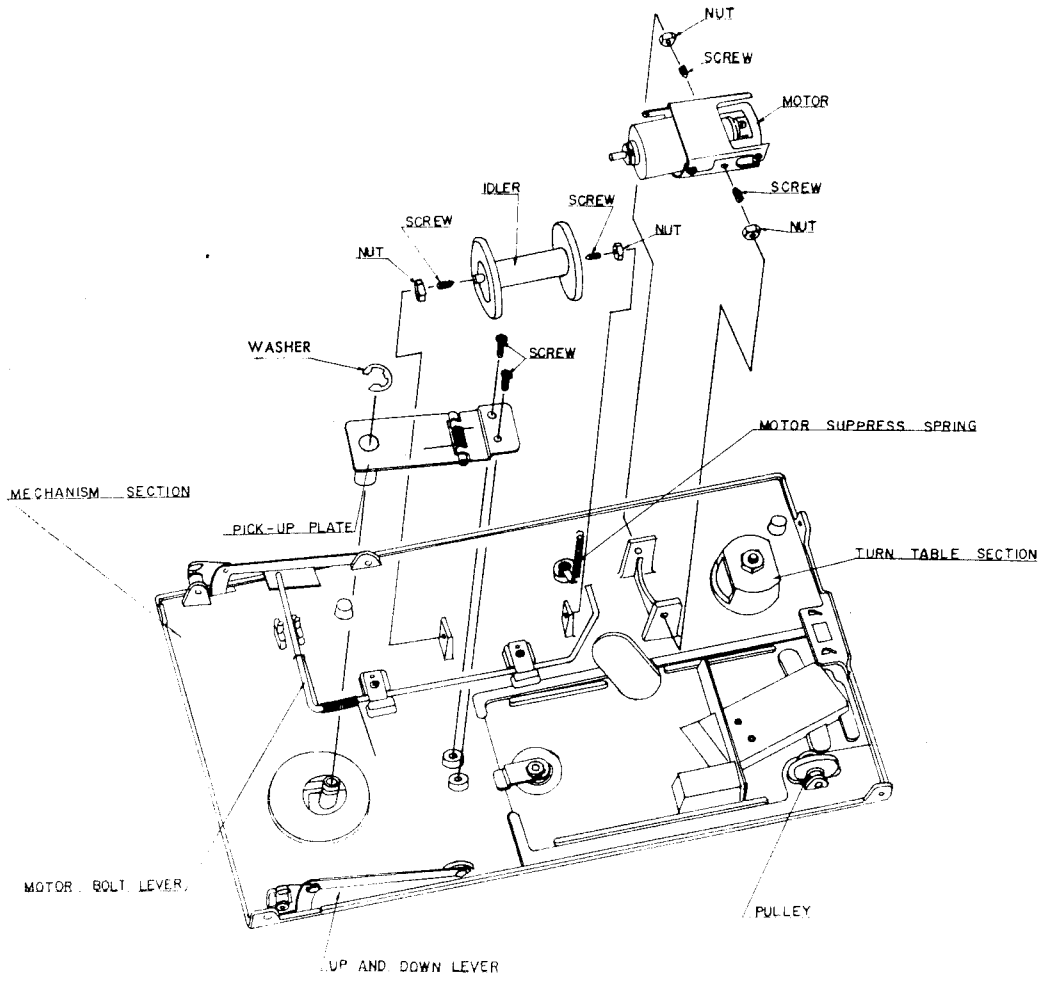
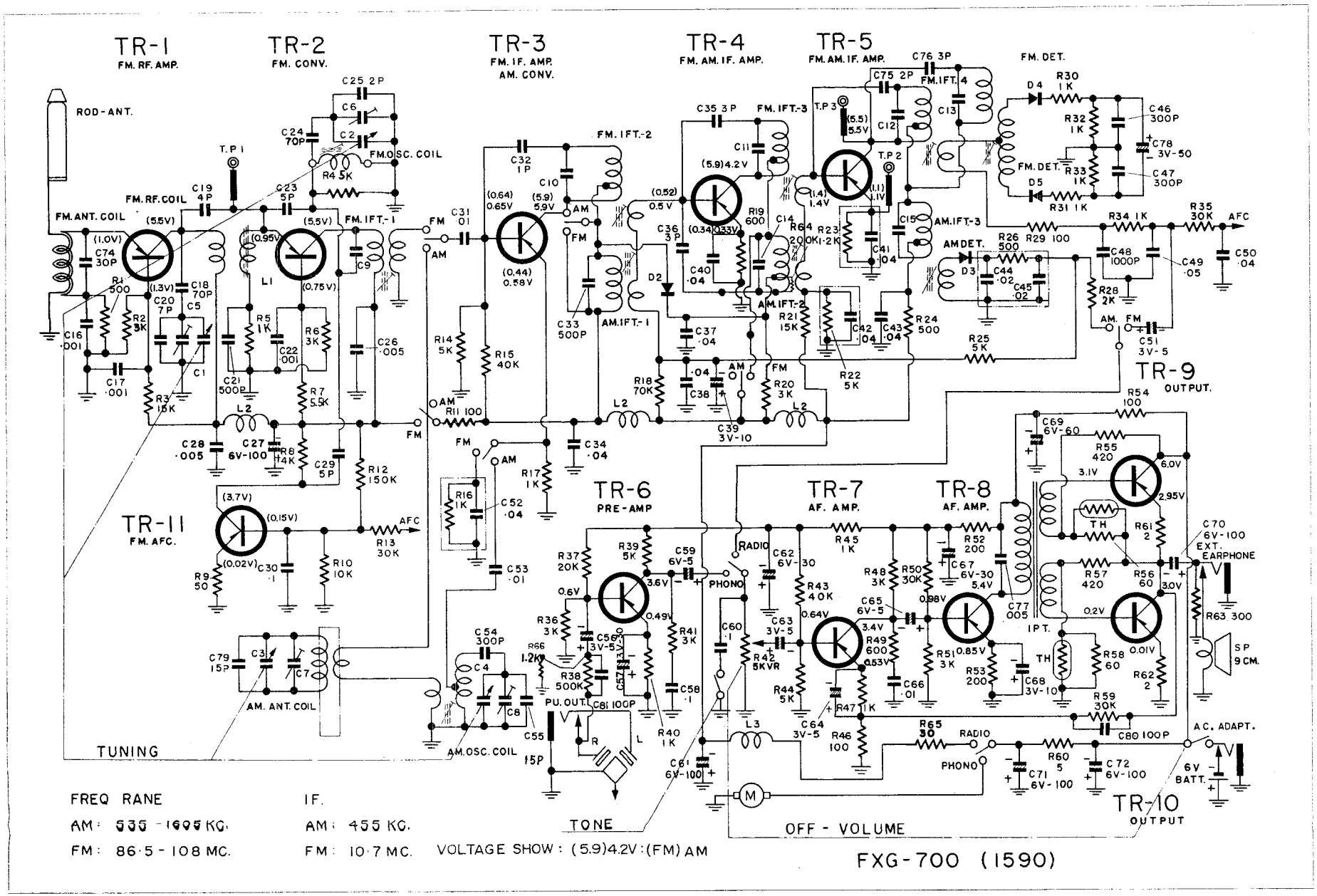
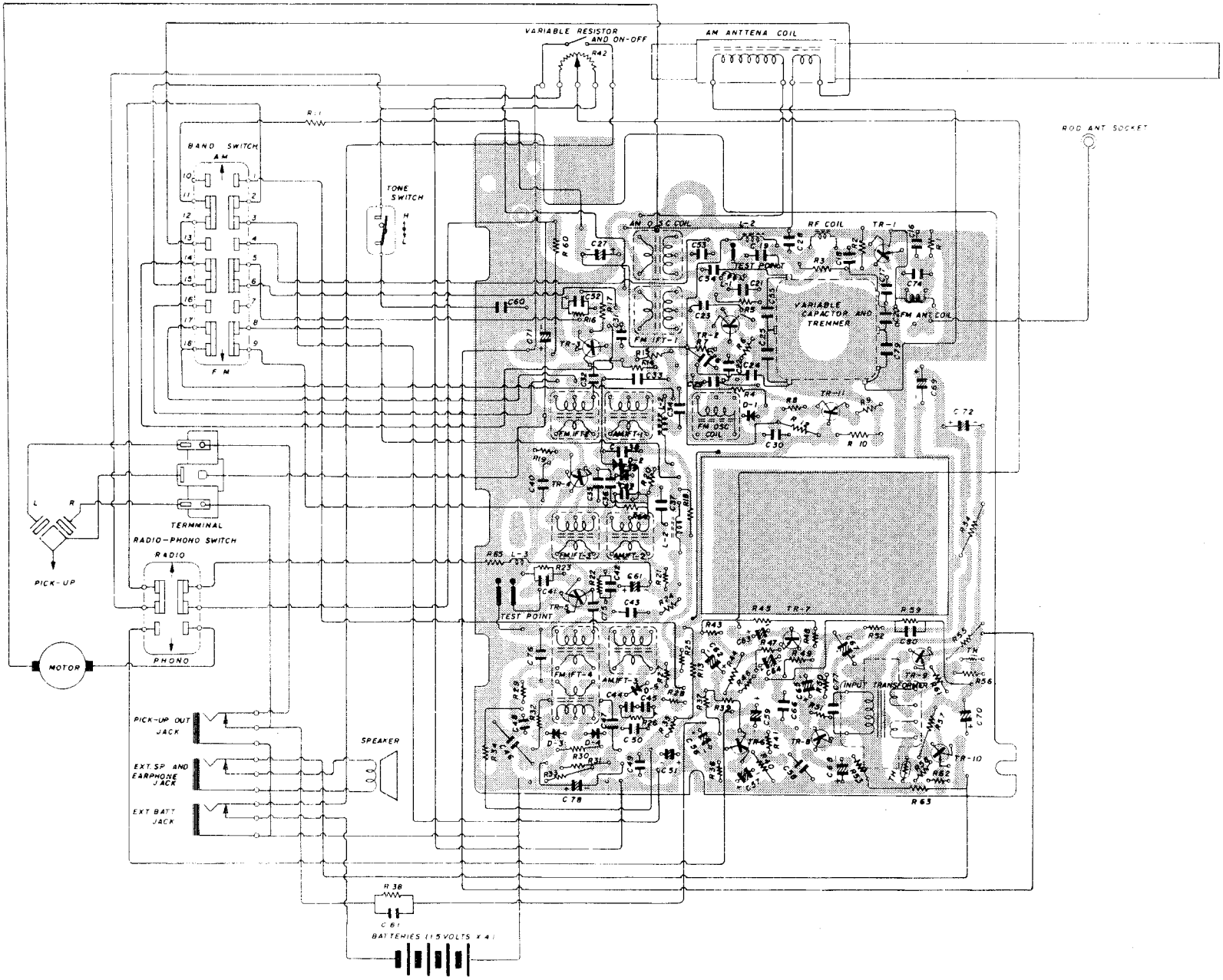

NUT
SCREW
MOTOR
SCREW
NUT
IDLER
SCREW
SCREW
NUT
NUT
WASHER
SCREW
MOTOR SUPPRESS SPRING
MECHANISM SECTION
PICK-UP PLATE
TURN TABLE SECTION
MOTOR BOLT LEVER
PULLEY
UP AND DOWN LEVER

Figure 9

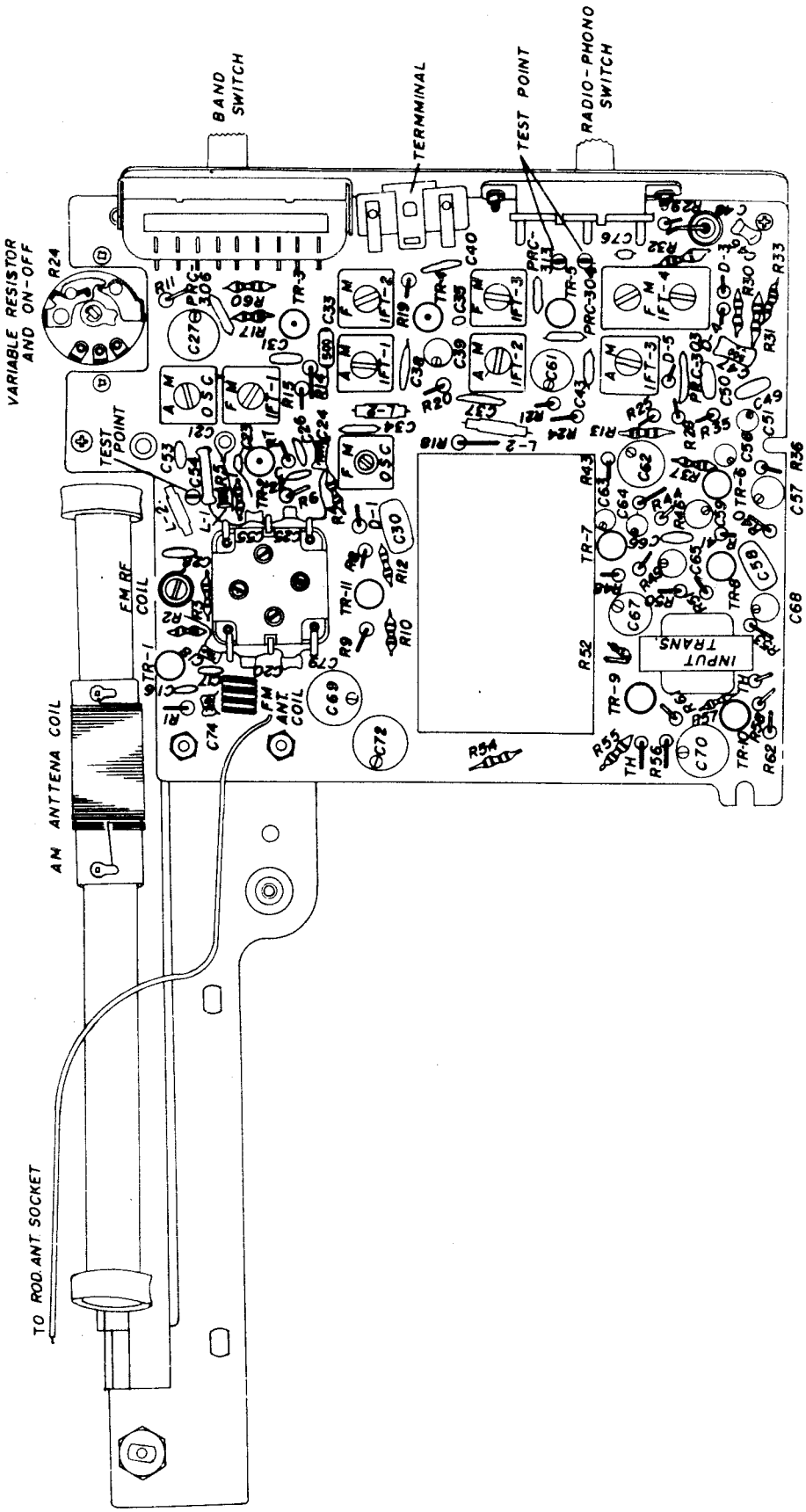
# SCHEMATIC DIAGRAM



# BOTTOM VIEW OF PRINTED CIRCUIT BOARD



# TOP VIEW OF PRINTED CIRCUIT BOARD



# ALIGNMENT INSTRUCTIONS

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

1) Connect an output meter across the speaker voice coil lugs.

2) Set volume control for maximum.

3) Use lowest setting of signal generator capable of producing adequate indication on lowest scale of output meter.

4) Use a non-metallic alignment tool.

5) Repeat adjustments to insure good results.

## ALIGNMENT CHART

| AM ALIGNMENT | | SIGNAL GENERATOR | | RECEIVER | | ADJUST |
|---|---|---|---|---|---|---|
| STEP | BAND | CONNECTION TO RECEIVER | INPUT SIGNAL FREQUENCY | DIAL SETTING | REMARKS | |
| 1 | M.W. | Connect signal generator through a 10KΩ dummy to the antenna tuning capacitor. Ground lead to the receiver chassis. | Exactly 455KC. (400%, 30%, AM modulated) | Tuning gang fully open. (minimum capacity) | Adjust for maximum output on speaker voice coil lugs. | 3rd-IF trans. core (7IF-734) 2nd-IF trans. core (7IF-765) 1st-IF trans. core (7IF-732) |
| 2 | M.W. | Use rediating loop. Loop of several turns of wire, or place generator lead close to receiver for adequate signal pickup. Connect generator output to one end of this wire. | Exactly 525KC. (400%, 30%, AM modulated) | Tuning gang fully closed. (maximum capacity) | Same as Step 1. | MW Oscillator core (7L-421B) |
| 3 | M.W. | Same as Step 2. | Exactly 1650KC. (400%, 30%, AM modulated) | Tuning gang fully open. (minimum capacity) | Same as Step 1. | MW Oscillator trimmer (C 8) |
| 4 | M.W. | Same as Step 2. | Exactly 600KC. (400%, 30%, AM modulated) | 600KC. | See NOTE 1 below. | MW Antenna coil (7L-232A) |
| 5 | M.W. | Same as Step 2. | Exactly 1400KC. (400%, 30%, AM modulated) | 1400KC. | Same as Step 4. | MW Antenna trimmer (C 7) |
| 6 | M.W. | Repeat Step 2, 3, 4 and 5 until no further improvement is obtained. | | | | |

| FM ALIGNMENT | | SIGNAL GENERATOR | | RECEIVER | | ADJUST |
|---|---|---|---|---|---|---|
| STEP | BAND | CONNECTION TO RECEIVER | INPUT SIGNAL FREQUENCY | DIAL SETTING | REMARKS | |
| 1 | F.W. | Connect signal generator through a 10KΩ dummy to converter emitter, test point 1, of TR2 Ground lead to the receiver chassis. | Exactly 10.7MC (400%, 30%, AM modulated) | Tuning gang fully closed. (maximum capacity) | See NOTE 2 below. | 3rd-IF trans. core (7IF-745) 2nd-IF trans. core (7IF-744) 1st-IF trans. core (7IF-735) |
| 2 | F.M. | Same as Step 1. | Exactly 10.7MC (Unmodulated) | Same as Step 1. | See NOTE 3 below. | Discriminator trans. core (7IF-739) |
| 3 | F.M. | Connect signal generator through a 100Ω including output impedance of signal generator to the external antenna coil lug. Ground lead to the receiver chassis. | Exactly 86MC (400%, 30%, FM modulated) | Tuning gang fully closed. (maximum capacity) | Adjust for maximum output speaker voice coil lugs. | FM Oscillator core (7L-423B) |
| 4 | F.M. | Same as Step 3. | Exactly 110MC (400%, 30%, FM modulated) | Tuning gang fully open. (minimum capacity) | Same as Step 3. | FM Oscillator trimmer (C 6) |
| 5 | F.M. | Same as Step 3. | Exactly 88MC (400%, 30%, FM modulated) | 88MC. | Same as Step 3. | FM, RF core (7L-514C) |
| 6 | F.M. | Same as Step 3. | Exactly 105MC (400%, 30%, FM modulated) | 105MC. | Same as Step 3. | FM, RF trimmer (C 5) |
| 7 | F.M. | Repeat Step 3, 4, 5 and 6 until no further improvement is obtained. | | | | |

## NOTE

**(1)** Check alignment of receiver antenna coil by bringing a piece of powdered iron (such as a coil slug) near the antenna loop stick, then a piece of brass. If powdered iron increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inductance.

**(2)**

1) Connect the receiver chassis through a 0.05 MFD capacitor to IF3 collector, test point 2, of TR5.
2) Connect VTVM (10 millivolts range A.C. scale) across IF3 emitter, test point 3, of TR5.
3) Attenuate signal generator output to maintain approximately 6 millivolts to prevent overloading.
4) Adjust output on test point 3, for maximum.

**(3)**

1) Connect VTVM (0.1 volt range D.C. scale) across volume control of receiver. (Grounded terminal to high side of control.)
2) Adjust discriminator sec.) core for VTVM O volt.
3) Change signal generator frequency 10.7M.C.±100KC. approximately.
4) Adjust discriminator pri. core for balanced peaks. Peak separation should be approximately 200KC.

# PARTS LIST

## RESISTORS

| REF NO. | PART NO. | DESCRIPTION |
|---|---|---|
| $R_1, R_{24}$ | 1/0 SA-500J | 500 ohm |
| $R_2, R_6, R_{20}, R_{36}$ $R_{41}, R_{48}, R_{51}$ | 1/0 SA-3KJ | 3K ohm |
| $R_3, R_{21}$ | 1/0 SA-15KJ | 15K ohm |
| $R_4, R_{14}, R_{25}, R_{28}$, $R_{39}, R_{44}$ | 1/0 SA-5KJ | 5K ohm |
| $R_7$ | 1/0 SA-5.5KJ | 5.5K ohm |
| $R_8$ | 1/0 SA-4KJ | 4K ohm |
| $R_9$ | 1/2 SA-50J | 50 ohm |
| $R_{10}, R_{27}$ | 1/0 SA-10KJ | 10K ohm |
| $R_{11}, R_{29}, R_{54}, R_{46}$ | 1/0 SA-100J | 100 ohm |
| $R_{12}$ | 1/0 SA-150KJ | 150K ohm |
| $R_{13}, R_{35}, R_{50}, R_{59}$ | 1/0 SA-30KJ | 30K ohm |
| $R_{15}, R_{43}$ | 1/0 SA-40KJ | 40K ohm |
| $R_5, R_{17}, R_{30}, R_{31}$, $R_{32}, R_{33}, R_{34}, R_{40}$ $R_{45}, R_{47}$ | 1/0 SA-1KJ | 1K ohm |
| $R_{18}$ | 1/0 SA-70KJ | 70K ohm |
| $R_{19}, R_{49}$ | 1/0 SA-600J | 600 ohm |
| $R_{37}$ | 1/0 SA-20KJ | 20K ohm |
| $R_{38}$ | 1/0 SA-500KJ | 500K ohm |
| $R_{52}, R_{53}$ | 1/0 SA-200J | 200 ohm |
| $R_{55}, R_{57}$ | 1/0 SA-420J | 420 ohm |
| $R_{56}, R_{58}$ | 1/0 SA-60J | 60 ohm |
| $R_{60}$ | 1/0 SA-5J | 5 ohm |
| $R_{61}, R_{62}$ | 1/0 SA-2J | 2 ohm |
| $R_{63}$ | 1/0 SA-300J | 300 ohm |
| $R_{64}$ | 1/0 SA-200KJ | 200K ohm |
| $R_{65}$ | 1/0 SA-30J | 30 ohm |
| $R_{66}$ | 1/0 1/4M-1.2KK | 1.2K |

## TRANSISTORS, DIODES & THERMSITER

| REF NO. | PART NO. | DESCRIPTION |
|---|---|---|
| $TR_1$ | 2SA 235 | (A) FM RF AMP |
| $TR_2$ | 2SA 235 | (C) FM CONV. |
| $TR_3$ | 2SA 350 | AM CONV. FM AM IF. AMP. |
| $TR_4$ | 2SA 234 | (B or C) FM AM IF AMP. |
| $TR_5$ | 2SA 12A | AFC |
| $TR_6$ | 2SB 75 | (B) PRE, AMP |
| $TR_7$ | 2SB 77 | (B) AF AMP. |
| $TR_8$ | 2SB 156 | (A) Output |
| $D_{1,2}$ | IN 34A | Detector for FM (2 pcs.) |
| $D_3$ | IN 34A | for AM (1 pc.) |
| $D_4$ | IN 34A | for AGC (1 pc.) |
| TH | B-1A | Thermister |

## CAPACITORS

| REF NO. | PART NO. | DESCRIPTION |
|---|---|---|
| $C_{16}, C_{17}, C_{22}$ | D-5-106P | Ceramic Capacitor 1.000PF |
| $C_{18}, C_{24}$ | D-5-708J | Ceramic Capacitor 70PF |
| $C_{19}$ | D-5-409D | Ceramic Capacitor 4PF |
| $C_{20}$ | D-5-709F | Ceramic Capacitor 7PF |
| $C_{21}, C_{33}$ | T-5-507J | Ceramic Capacitor 500PF |
| $C_{23}, C_{29}$ | D-5-509D | Ceramic Capacitor 5PF |
| $C_{25}, C_{75}$ | D-5-209D | Ceramic Capacitor 2PF |
| $C_{26}, C_{28}$ | D-3-506P | Ceramic Capacitor 500PF |
| $C_{27}, C_{61}, C_{70}$ $C_{72}$ | CU-06-101X | Electrolytic Capacitor 100$\mu$F |
| $C_{30}, C_{58}, C_{60}$ | ML-5-104M | Mylar Capacitor 0.1$\mu$F |
| $C_{31}, C_{53}$ | ML-5-105M | Mylar Capacitor 0.1$\mu$F |
| $C_{32}$ | D-5-109D | Ceramic Capacitor 1PF |
| $C_{34}, C_{37}, C_{38}$ $C_{40}, C_{43}$ | K-3-405Z | Ceramic Capacitor 0.04$\mu$F |
| $C_{39}$ | CU-03-102X | Electrolytic Capacitor 10$\mu$F |
| $C_{35}, C_{36}, C_{76}$ | D-5-309D | Ceramic Capacitor 3PF |
| $C_{46}, C_{47}, C_{54}$ | T-5-307J | Electrolytic Capacitor 300PF |
| $C_{48}$ | S-5-106K | Styrol Capacitor 1000PF |
| $C_{49}$ | ML-5-505M | Mylar Capacitor 0.05$\mu$F |
| $C_{50}$ | ML-5-405M | Mylar Capacitor 0.04$\mu$F |
| $C_{51}, C_{56}, C_{63}$ $C_{64}$ | CU-03-503X | Electrolytic Capacitor 5$\mu$F |
| $C_{55}, C_{79}$ | D-3-158F | Ceramic Capacitor 15PF |
| $C_{57}$ | CU-03-302X | Electrolytic Capacitor 30$\mu$F |
| $C_{59}, C_{65}$ | CU-06-503X | Electrolytic Capacitor 5$\mu$F |
| $C_{62}, C_{67}$ | CU-06-302X | Electrolytic Capacitor 30$\mu$F |
| $C_{69}$ | CU-06-602X | Electrolytic Capacitor 60$\mu$F |
| $C_{71}$ | CT-06-502X | Electrolytic Capacitor 100$\mu$F |
| $C_{77}$ | ML-5-506M | Mylar Capacitor 5000PF |
| $C_{78}$ | CU-03-502Q | Electrolytic Capacitor 50$\mu$F |
| $C_{80}, C_{81}$ | T-5-107J | Ceramic Capacitor 100PF |
| $R_{26}, C_{44}, C_{45}$ | PRC-303 | Compound Capacitor |
| $R_{22}, C_{42}$ | PRC-304 | Compound Capacitor |
| $R_{16}, R_{52}$ | PRC-306 | Compound Capacitor |
| $R_{23}, C_{41}$ | PRC-313 | Compound Capacitor |

## COILS & TRANSFORMERS

| | | |
|---|---|---|
| | 7L-158A | FM Antenna Coil |
| | 7L-232A | MW Antenna Coil |
| | 7L-421B | MW Oscillation Coil |
| | 7L-423B | FM Oscillation Coil |
| | 7L-514C | RF Antenna Coil |
| AM IFT-1 | 7IF-732 | MW IF Transformer |
| AM IFT-2 | 7IF-765 | MW IF Transformer |
| AM IFT-3 | 7IF-734 | MW IF Transformer |
| FM IFT-1 | 7IF-735 | FM IF Transformer |
| FM IFT-2 | 7IF-744 | FM IIF Transformer |
| FM IFT-3 | 7IF-745 | FM IF Transformer |
| FM IFT-4 | 7IF-739 | FM IF Transformer |
| | 7L-905 | RF Choke Coil |
| | 7L-916 | RF Choke Coil |
| | 7L-918 | RF Choke Coil |
| 1PT | 6T-771 | Input Transformer |

# MISCELLANEOUS

| DESCRIPTION | DESCRIPTION |
|---|---|
| Cabinet (Front) | Trimmer Angle |
| Cabinet (Rear) | Volume Angle |
| Dial Knob (9K-169) | Boss (331) |
| Volume Control (9K-170) | Pulley (476) |
| Pointer | Pulley (743) |
| Dial | Dial Shaft (735) |
| Indicator Plate (Front) | Dial Plate (727) |
| Indicator Plate (Rear) | Dial Plate (717) |
| Dial Plate | Spring with String |
| Decoration Metal | Spring with String |
| Speaker Angle | Pipe for Battery |
| Felt | Spring for Battery |
| Cushion (for Front Cabinet) (Molt Plen) | Battery Terminal |
| Cushion (for Rear Cabinet) (Molt Plen) | Pipe for Battery Terminal |
| Handle | Shaft for Dial Plate |
| Spacer for Handle | Spacer for Jack |
| Hole Cover | Spacer for Jack |
| Spring for Hook | Jack (104) |
| Spring for Leg | Jack (302) |
| Angle for Handle | Slide Switch (Radio/Phono) (4S-4) |
| Leg | Slide Switch (FM/AM) (4S-25) |
| Hook | Slide Switch (High/Low) (4S-32) |
| Spacer | Variable Resistor (8V-729) |
| Angle for Leg | Variable Capacitor (VC-318) |
| Antenna Stocker | Speaker (9P-23E) |
| External Antenna | Rod Antenna |
| Antenna Sub Antenna | Player Unit (RPU-118) |
| Printed Circuit Board | Crystal Earphone |
| Lug (209) | Volume Angle |
| Core Holder (56) | Boss (331) |
| Angle for Switch | Boss (332) |
| Angle for Pulley | |